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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/056,728 | 01/22/2002 | Andrew Storm | 52637-0021 | 2098 |

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| EXAMINER | |
|---|---|
| TRAN, KHAI | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2637 | |

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/056,728 | STORM ET AL. | |
| | Examiner | Art Unit | |
| | KHAI TRAN | 2637 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-22,39-44 and 61-66* is/are allowed.

6)☒ Claim(s) *1-9, 11-16, 23-31, 33-38,45-53,55-60,67-69,* is/are rejected.

7)☒ Claim(s) *10,32 and 54* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 sheets*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. Claims 67-68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 67-68 are narrative in form and do not contain positively recited **steps** of a specific process. Note that method claims should be set forth **a series of steps** in the active tense in an instruction-like manner thereby reciting an actual method. The claim only recites a **single step** without any additional **steps delimiting** how its use is actually practiced. Dependent claims (if applicable) should further limit base claims by reciting additional method steps in a likewise fashion. Ex parte Erlich 3UPQ2d 1011 at 1017 [6].

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 8, 14, 24-28, 30, 35, 36, 45, 49-50, 59, 67-69 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 5, 11, 14, 16, 17, 22, 23, 26, 27-29, 37, 38, 39-41 of copending Application No. 09/754,007. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims 2, 5, 11, 14, 16, 17, 22, 23, 26, 27-29, 37, 38, 39-41 of the instant application merely broadens the scope of the claims 1, 8, 14, 24-28, 30, 35, 36, 45, 49-50, 59, 67-69 of the co-pending Application No. 10/056,728 by eliminating the elements and their functions of claims 1, 8, 14, 24-28, 30, 35, 36, 45, 49-50, 59, 67-69 of the copending application. It has been held that the omission an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA). Also note Ex parte Rainu, 168 USPQ 375 (Bd.App.1969); omission of a reference element whose function is not needed would be obvious to one skilled in the art.

Regarding claims 1, 8, 14, 24-28, 30, 35, 36, 45, 49-50, 59, 67-69 of the instant application disclose a step of receiving, from the communications channel, received data is based upon both modulated data and noise as recited in claims of the U.S. Application 09/754,007 instead of distortion. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include noise in the communication channel because the both inventions are used to reduce noise, the distortion, or the noise power.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2-9, 11-16, 23-31, 33-38, 45-53, 55-60, 67-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al (U.S. Pat. 6,388,513) in view of Andre (U.S. Pat. 6,788,752).

Regarding claim 1, Wright et al disclose a method for processing data received from a communications channel as shown in Figures 15 and 16, comprising the computer-implemented steps of: receiving, from the communications channel, received data that is based upon both modulated data and noise, wherein the modulated data is the result of original data modulated onto one or more carriers (a bulk delay, gain and phase stage "74") followed by an FIR "76" which incorporates the frequency domain

variations of these parameters); equalizing the received data to generate equalized data, wherein the equalizing is performed using an algorithm with a set of one or more coefficients selected based on noise power and an impulse response of the communications channel; and recovering an estimate of the original data by demodulating the equalized data col. 27, lines 40-55 wherein the coefficients of the FIR filter 76 are stored in a data structure 78 (comprising: FIR coefficient$_s$ ... FIR coefficient$_0$. Wright et al fail to disclose a step of recovering an estimate of the original data by modulating the equalized data.

Andre discloses a receiver comprising receive analog filter 20, A/D converter 21, a time domain equalizer (TEQ) 23 which may be a finite impulse response filter (FIR), a tail estimate circuitry 24 as shown in Figure 1 (receiver), wherein an output signal provided by FFT (28) to a decoder for recovering the original data. It would have been obvious to one having ordinary skill in the art at the time invention was made to recover the original data from the transmitted data as taught by Andre into the teachings of Wright et al in order to retrieve a desired data.

Regarding claim 2, Andre discloses the set of one or more coefficients is selected to optimize an impulse response length of the communication channel to reduce interference (col. 6, lines 18-55, wherein the length of filter, i.e. the length of the filter coefficients, $g_k$, can be chosen to have a suitable value. Therefore, the suitable value chosen from the filter coefficients for reducing the interference as recite din claim 2.

Regarding claims 3 and 4, Andre also discloses the interference including inter-symbol interference (ISI); inter-channel interference (ICI) (col. 2, line 2-19).

Regarding claims 5, 6, Wright et al disclose the set of one or more coefficients being selected to reduce the noise power (col. 14, lines 13-65).

Claim 7 is rejected as similar to claims 2 and 5.

Regarding claim 8, Andre further discloses a cyclic prefix being added to the modulate data (an add CP 11 as shown in Fig. 1); and performing step of equalizing being less than a length of the cyclic prefix (col. 6, line 56 to col. 7, line 22).

Claim 9 is rejected due to a similar to claims 3-5.

Claim 11 is rejected due to a similar to claims 2 and 5.

Regarding claim 12, Wright et al disclose wherein the set of one or more coefficients are selected based on noise power spectral density (col. 22, line 65 to col. 23, line12).

Regarding claim 13, Wright et al disclose a FIR filter (Fig. 15).

Claim 14 is similar to claims 2 and 5; furthermore, Andre discloses the received data being modulated using discrete multi-tone modulation (DMT) (col. 1, lines 14-40).

Regarding claims 15, 16, Andre discloses the channel being a twisted pair (see Fig. 1); and the twisted pair telephone line using a transmission protocol selected from the group consisting of ADSL and VDSL (col. 1, line 14-40).

Claims 23-31, 33-38 are similar to claims 1-9, 11-16. Therefore, claims 23-31, and 33-38 are rejected under a similar rationale.

Claims 45-53, 55-60 are similar to claims 1-9, 11-16. Therefore, claims 45-53, and 55-60 are rejected under a similar rationale.

Claims 67-69 are similar to claim 1. Therefore, claims 67, 68, 69 are rejected under a similar rationale.

### *Allowable Subject Matter*

7. Claims 39-44, 17-22, 61-66 are allowed.

8. Claims 10, 32, 54 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: Wright et al and Andre fail to disclose steps of: determining a noise covariance based on the noise power spectral density and determining the coefficients based on the communications channel impulse response and the noise covariance.

### *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wright et al (US 2002/0044014 A1) disclose an amplifier measurement.

Storm et al (US 2002/0131537 A1) disclose an approaching for processing data received from a communications channel to reduce noise power.

Blanchard et al (U.S. Pat. 5,703,903) disclose an adaptive filter.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KHAI TRAN
Primary Examiner
Art Unit 2637

***KT***
***May 25, 2005***